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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/788,437	02/21/2001	Albert M. Leung	S168 0114 GNM/sks	5239

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EXAMINER	
FERGUSON, MARISSA L	
ART UNIT	PAPER NUMBER
2854	

DATE MAILED: 07/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/788,437	LEUNG, ALBERT M.	
	Examiner	Art Unit	
	Marissa L Ferguson	2854	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 March 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21 and 30-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *,13-15 and 37* is/are allowed.

6)☒ Claim(s) *1-10,12,16-21,30-34,36 and 38-43* is/are rejected.

7)☒ Claim(s) *11,35* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 February 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/24/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1,2,12,16-19,21,30,31,36 and 38-43are rejected under 35 U.S.C. 103(a) as being unpatentable over Chou et al. ("Fabrication and Study of a Shallow Gap Pirani Vacuum Sensor with a Linearly Measurable Atmospheric Pressure Range") in view of Sparks et al. (US Patent 5,706,565).

Regarding claims 1,19,30 and 40 Chou et al. teaches a means for heating a member ,a means for monitoring a temperature of a member connected to control an output signal to indicate a pressure of a gas to which a pressure sensor is exposed (Pages 383-388 and 391) and a substrate (Figure 1, bottom layer). However, he does not explicitly disclose a member adherent by bonding to a surface of a substrate. Sparks et al. teaches wafer-to-wafer bonding (Column 2, Lines 22-35 and Column 5, Lines 22-26) which is a conventional process used to ensure a strong mounting connection.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the invention as taught by Chou et al. to include the bonding techniques as taught by Sparks et al., since Sparks et al. provides a stable and durable sealed connection of the device.

Regarding claims 2,17,18,21, 31,39 and 41, Chou et al. teaches a surface of a member in contact with a substrate and a surface of a substrate in contact with a member, he does not explicitly disclose a degree of roughness that comprises valleys and plateaus. Surface roughness is an inherent feature, since every type of surface has some degree of roughness. However, Chou et al. does not explicitly disclose an electrically conductive member in physical contact with a surface of a member. Sparks et al. teaches a wafer (12) that is in contact with an electrically conductive member (14 and Column 3, Lines 7-24). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the invention as taught by Chou et al. to include the electrically conductive member in contact with a surface as taught by Sparks et al., since Sparks et al. in order to promote reliability and improve performance characteristics.

Regarding claim 10, Chou et al. teaches a member that has length in the range of 50 to 250μm and a width of 1 to 10μm (Page 387, Part 3).

Regarding claims 12,16,36,38,42 and 43 Chou et al. teaches an electrically insulating layer (Page 387, Section 3) on a surface of a member, a member comprising polysilicon and an electrically insulating layer comprising a layer of silicon oxide (Figure 4), and comprising an electrically insulating layer/barrier on a surface of a substrate (Figure 4).

2. Claims 3-9 and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chou et al. ("Fabrication and Study of a Shallow Gap Pirani Vacuum Sensor with a Linearly Measurable Atmospheric Pressure Range") in

view of Sparks et al. (US Patent 5,706,565) as applied to claims 1,2,12,16-19,21,30,31,36 and 38-43above, further in view of Schieferdecker et al. (US Patent 5,597,957).

Regarding claims 3, 4 and 32 Chou et al. and Sparks et al. both teach the invention except a means for heating a member comprising an electrically conductive pathway that that has a temperature dependent resistance and a source of electrical current. Schieferdecker et al. teaches a means for heating a member comprising an electrically conductive channels that that has temperature dependent resistance and a source of electrical current (Abstract, Column 3, Lines 48 and 63 and Column 5) that ensures proper heating.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to further modify the invention as taught by Chou et al. to include the channels as taught by Schieferdecker et al., since Schieferdecker et al. provides and assures proper compensation of temperature fluctuations of a member.

Regarding claims 5-7, Chou et al. teaches an electrically insulating layer (Page 387, Section 3) on a surface of a member, a member comprising polysilicon and an electrically insulating layer comprising a layer of silicon oxide (Figure 4), and comprising an electrically insulating layer/barrier on a surface of a substrate (Figure 4).

Regarding claims 8,9 and 33-34, Chou et al. and Sparks et al. both teach the invention except a bridge extending between cantilever members, cantilever members attached to a substrate by pads and a bridge having a central

collapsed portion. Shieferdecker et al. teaches a bridge-like structure extending between cantilever web-like members (42,44) and cantilever web-like members attached to a substrate by pads (Figure 2c). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to further modify the invention as taught by Chou et al. to include the bridge configuration as taught by Schieferdecker et al., since Schieferdecker et al. provides and assures proper compensation of temperature fluctuations of a member.

3. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chou et al. ("Fabrication and Study of a Shallow Gap Pirani Vacuum Sensor with a Linearly Measurable Atmospheric Pressure Range") in view of Sparks et al. (US Patent 5,706,565) as applied to claims 1 and 9 above, further in view of Saul et al. (US Patent 6,290,388).

Chou et al. teaches the invention claimed however he does not explicitly disclose a temperature sensor with p-n junctions. Saul et al. teaches a temperature sensor that provides a p-n junction. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to further modify the invention as taught by Chou et al. to include a p-n junction as taught by Saul et al., since Saul et al. provides a region for making and transferring electrical contact between a diode and a heater.

Allowable Subject Matter

4. Claims 13-15 and 37 are allowed.

5. Claims 11 and 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reasons for Allowance

6. The following is an examiner's statement of reasons for allowance: regarding claims 11 and 35, the prior art does not teach or render obvious a pressure sensor wherein a member comprises a generally linear elongated bridge supported above the substrate at either end, the bridge having a central portion collapsed onto and adhering by stiction to a surface of the substrate.

Response to Arguments

7. Applicant's arguments filed 3/18/04 have been fully considered but they are not persuasive. Regarding applicant's comments "In the face of Chou's clear and explicit teaching that stiction is to be avoided", examiner notes that Sparks et al. teaches the advantages of stiction. In regards to Chou teaching away, a prior art reference that "teaches away" from the claimed invention is a significant factor to be considered in determining obviousness; however, "the nature of the teaching is highly relevant and must be weighed in substance. A known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use." In re Gurley, 27 F.3d 551, 554, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994) (Claims were directed to an epoxy resin based printed circuit material. A prior art reference disclosed a polyester-imide resin based printed circuit material, and taught that

although epoxy resin based materials have acceptable stability and some degree of flexibility, they are inferior to polyester-imide resin based materials. The court held the claims would have been obvious over the prior art because the reference taught epoxy resin based material was useful for applicant's purpose, applicant did not distinguish the claimed epoxy from the prior art epoxy, and applicant asserted no discovery beyond what was known to the art.).

8. In response to applicant's comments regarding claims 17 and 39, "the cited references fail to disclose a substrate patterned with a pattern of plateaus and valleys in its portion under a member". Examiner notes the rejection in accordance with claims 17 and 39 states that the substrate would inherently possess the roughness quality that would mean in the broadest sense that the roughness of plateaus and valleys would cover all surfaces of the substrate including the area under the member.

9. Applicant's arguments with respect to claims 11,21,35 and 41 have been considered but are moot in view of the new ground(s) of rejection.

10. In response to applicant's comments regarding "surface roughness in the range of nanometers to tens of nanometers, as claimed in claims 21 and 41, is not inherent in all surfaces". Regarding the range of roughness and the particular metrics: Chou et al. discloses a substrate and member having roughness but does not disclose a particular value for this parameter. However, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide a substrate having a roughness and particular metric value, since it has been held that where the general conditions of a claim

are disclosed in the prior art, discovering the "optimum range" involves only routine skill in the art. ***In re Aller***, 105 USPQ 233.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marissa L Ferguson whose telephone number is (703) 305-3194. The examiner can normally be reached on (M-T) 6:30am-4:00pm and every other (F) 7:30am-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Hirshfeld can be reached on (703) 305-6619.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

Marissa L Ferguson
Examiner
Art Unit 2854

MLF

Daniel J. Colilla
Primary Examiner
Art Unit 2854